USA: California: Dutch Slough Tidal Marsh Restoration

Overview

The Dutch Slough site offers an opportunity for large-scale tidal marsh restoration, habitat enhancement and open space preservation in the rapidly urbanizing area of eastern Contra Costa County. During the past twenty years, eastern Contra Costa County has undergone a rapid urbanization, and in 1997, the county approved a development agreement for this property that would have allowed for the construction of 4,500-6,100 housing units on the site. When the City of Oakley incorporated in 1999, the Dutch Slough property was within the city limits, and the City was required to accept the County's development agreement. In the fall of 2001 the Natural Heritage Institute (NHI) and the Department of Water Resources identified this site as an important restoration opportunity and began working cooperatively with the former landowners to obtain grant funding to acquire and restore the property. The 1,166-acre site was purchased in 2003, and restoration planning was still ongoing as of 2006. Restoration activities are expected to last at least 30 years, and the project will be conducted using an adaptive management framework, whereby management actions will be designed to test hypotheses about the ecosystem and the most effective strategies for its restoration. In this way, the project will yield valuable insight into the processes governing restoration and will increase our overall understanding of the science.

Project Details

Lead Entity:

Natural Heritage Institute (NHI) and Department of Water Resources

Lead entity types:

- National NGO

Adaptive management

Describe adaptive management processes and mid-course corrections taken to address unforeseen challenges and improve outcomes in each of the following categories:

Other:

The Dutch Slough project provides a significant opportunity to improve understanding of restoration science in the Delta ecosystem. Adaptive management employs the scientific method to maximize the information value of restoration and management actions. With the assistance of a panel of scientists, the project team will design restoration actions to test hypotheses about how the ecosystem functions and how best to achieve the project objectives. In this respect, adaptive management interventions are conducted as experiments. Project implementation will be guided by the best available information but will be monitored and implemented with the goal of increasing our understanding about the science of restoration.

State of Progress:

- Implementation

Project Start:

2003-07-06

Project End:

2003-07-06

Total budgeted expenses:

- USD 10-50 million

Global Regions:

- Northern America
- Americas
- World

Countries:

- United States of America

Ecosystem Functional Groups / Biomes:

- Brackish tidal biome

Ecosystems:

- Coastal saltmarshes and reedbeds

Extent of project:

- Other

Extent of restoration:

- Other

Degradations:

- Other forms of unsustainable agricultural practices

Description:

The three parcels that comprise the Dutch Slough site were diked and drained for agriculture during the nineteenth century, perhaps as early as the 1850's. Emerson, Little Dutch Slough, and the eastern portion of Dutch Slough are all artificial channels that were dredged between 1904 and 1910. These artificial channels displaced a pre-existing channel network that was more sinuous and irregular.

Planning and Review

Goals and Objectives

Was a baseline assessment conducted:

UNSURE

Was a reference model used:

UNSURE

were_goals_identified:

YES

Goals and objectives:

- Other

Goals Description::

1. Provide shoreline access, as well as educational and recreational opportunities. 2. Benefit native species by re-establishing natural ecological processes and habitats. 3. Contribute to scientific understanding of ecological restoration by implementing the project under an adaptive management framework.

Stakeholder Engagement

Were Stakeholders engaged?:

unsure

Description of Stakeholder Involvement:

The Dutch Slough Restoration Committee has been established as a forum to exchange information, obtain input into the restoration planning and keep interested partners informed about other projects and regional issues that affect the Dutch Slough project. Key agencies and stakeholders have been invited to attend and participate on this Committee, and the meetings are open to the public.

Ecosystem Activities and Approaches

General Activities: The Emerson, Gilbert and Burroughs families sold the Dutch Slough properties to the California Department of Water Resources on October 30, 2003. DWR is working with the project partners and the AMWG to determine the best way to restore the site. The project partners hired a consulting firm, Phillip Williams & Associates to help develop restoration alternatives and conduct a feasibility analysis of those alternatives. Planning and feasibility studies were still ongoing as of 2006.

Categories of ecosystem restoration activities and approaches utilized:

- Ecological restoration

Specific type of rehabilitation and/or restoration approach implemented:

- Assisted natural recovery with planting, seeding, or faunal introductions (e.g. enrichment planting or seeding; farmer assisted natural regeneration; rewilding)

Project Outcomes

Eliminate existing threats to the ecosystem: Restoration activities at the Dutch Slough site are only just beginning and are expected to span more than 30 years. However, preliminary site assessments and feasibility reports have offered some insights into the eventual recovery of wetland habitat at the site. What follows are some of the expected outcomes of the project. The topographic and edaphic diversity of the Dutch Slough site creates the opportunity for restoring a diversity of wetland and upland habitats. Many wetland restoration sites are intensively graded to create a mosaic of habitat types. At Dutch Slough, it would be possible to create a mosaic of wetland habitat types along a gradient from open water to dendritic tidal marsh to seasonally inundated floodplain and riparian forest without any site grading. Restoration of the site could create large areas of edge habitat including shaded riverine aquatic and riparian habitat types along the property's extensive shoreline. The site has nearly 6 miles of relatively barren levee shoreline along major tidal sloughs and Marsh Creek that could be revegetated. Tidal inundation to the interior of the site would add nearly 10 miles of edge habitat. The spatial complexity and the daily wetting and drying of the mash edges should help young salmon and splittail avoid predators and provide an abundant source of chiromindae larvae, one of the main food sources for rearing splittail and salmon (Brown, in press). Furthermore, a range of elevation gradients within a wetland site, as well as disturbance regimes associated with sediment input and other fluvial processes, result in greater biodiversity and utilization by native aquatic species (Bayley 1991). The site encompasses ten different types of organic and mineral soils. This diversity of soils will result in a corresponding diversity of vegetation and habitat types, including riparian and dune species. Coarser mineral soils will allow for establishment of woody riparian species intermixed with freshwater marsh species, while the relatively high elevation aeolian deposits of Delhi sands will provide an opportunity for restoring Antioch Dune plant species on the site. The area surrounding Dutch Slough provides habitat for numerous declining and endangered species, and habitat restoration at Dutch Slough could significantly improve conditions for many of these sensitive species. Big Break, the Marsh Creek delta, and lower Marsh Creek already harbor Sacramento splittail, Chinook salmon, Delta smelt, and other aquatic species for which the Dutch Slough site will be restored. Dutch Slough may also be an excellent opportunity to restore waterfowl habitat. One distinct sub-habitat that may provide substantial habitat value for waterfowl without undue artificial engineering of the marsh (e.g. water control structures and diked marsh) may be shallow, large ponds along the terrestrial edges of the site, where spring high tides and runoff may form brackish seasonal or perennial ponds. Native submerged aquatic vegetation that thrives in open water and ponds (especially pondweeds, Potamogeton spp.) would provide valuable foraging opportunities for waterfowl (Baye 2004). Indeed, the diversity of birds and other animals along the Big Break shoreline, in Marsh Creek, and upstream suggest that many other CALFED priority species will use the restored Dutch Slough site. Over 150 native species have been observed (Glover, pers com; Orlof 2000), of which 18 are CALFED priority species (r - Bank Swallow, Black Rail, Sandhill Crane, Swainson's Hawk, Yellow Warbler; m - Black Tern, Black-Crowned Night-Heron, California Gull, Common Yellowthroat, Cooper's Hawk, Great Blue Heron, Great Egret, Northern Harrier, Snowy Egret, White-Faced Ibis, White-Tailed Kite, Yellow-Breasted Chat, Western Pond Turtle). A recent survey of lower Marsh Creek by a DWR biologist confirmed a western pond turtle population of approximately 15-20 individuals (Hamilton, pers com, 2001). East Bay Regional Park District scientists and USFWS experts believe the area also supports giant garter snakes (Bobzien pers. com. 2001). In addition to providing valuable habitat for important faunal species, the Dutch Slough project could also provide an opportunity to restore rare, riparian plant communities that were once more common in the Delta but are now extinct or nearly extinct. Dr. Baye suggested that the existing levees would provide a suitable opportunity for creating stands of the willow-ladyfern community. The sand mound riparian woodland is another rare plant community that could be restored on the site, perhaps on the sand deposits in the middle of the Burroughs parcel. Economic vitality and local livelihoods: The Dutch Slough site will provide an opportunity for people to access the Delta shoreline and learn about the process of wetland restoration. The popular Marsh Creek Regional Trail, which extends from Antioch Pier to the City of Brentwood, already traverses the southwestern boundary of the site. More trails are planned, and the project team is developing a public access master plan to define the exact location and configuration of the trail network. The conceptual trail plan negotiated with the City of Oakley assumes that the trails will be largely confined to the top of the levees and the southern edge of the site near the base of the Contra Costa Canal; however, this conceptual plan may be revised during development of the public access master plan. As currently conceived, the trail system will circumnavigate the Emerson parcel along the existing levee road. The road will eventually be paved to accommodate emergency vehicles and policing. Wildlife viewing platforms and small-scale fishing piers may be developed along the trail to sufficiently provide for and direct public access. The interior of the Emerson parcels will be open to canoe and kayak access along a prescribed water trail. Facilities will also be constructed for a combination of active and passive recreation, including sports fields, interpretive and educational centers, and a swimming lagoon on the 55-acre community park site just south of the actual restoration site. In the short term, project partners are planning site tours, canoe trips and other activities to give people (especially Oakley residents) an opportunity to visit the area before it is officially open to the public.

Monitoring and Data Sharing

Does the project have a defined monitoring plan?:

NO

Open Access URL:

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Long Term Management

STAPER

USA: California: Eradication of the Invasive Seaweed Caulerpa Taxifolia from Agua Hedionda Lagoon and Huntington Harbour (https://app.ser-rrc.org/api/v1/project/8859)

Country: United States of America

Activities:

Biomes:

Abstract: In the summer of 2000, the first known Western Hemisphere infestations of the invasive strain of the tropical marine alga, Caulerpa taxifolia, were discovered in Agua Hedionda Lagoon, Carlsbad, California and in Huntington Harbour, Huntington Beach, California. Commonly used in saltwater aquarium systems, earlier releases of C. taxifolia into coastal European and Australian waters have resulted in the establishment of extensive dense carpets of the seaweed, smothering diverse natural communities and dramatically reducing biodiversity by displacing native seaweeds and animals. Based on the aggressive nature of this species and the displacement of native marine resources observed upon its discovery in California, it was recognized that the infestations posed a major threat to coastal ecosystems, and recreational and commercial uses dependent upon coastal resources. Therefore, a large-scale, multi-agency eradication effort was undertaken to curb the spread of this prolific invader.

Learn More (https://app.ser-rrc.org/api/v1/project/8859)

USA: California: Forest Restoration in Campgrounds at Kings Canyon National Park (https://app.ser-rrc.org/api/v1/project/9084)

Country: United States of America

Activities:

Biomes:

Abstract: Intensive campground use at the Grant Grove area of Kings Canyon National Park, California, has compacted the soil and left areas without understory vegetation or tree recruitment. To better inform the restoration of these sites after closure, natural regeneration potential was tested against planting and soil restoration methods. The tested methods included planting with container stock and direct seeding, fencing, and soil treatments of tilling, mulching, and gypsum and humus additions. Container stock showed high survivorship (69 - 100%), while germination and survival from direct seeding was low (0.6 - 4.1%). Wood chip mulch proved beneficial to planting woody species, but detrimental to resident herbaceous species. Plots treated with tilling and gypsum, and humus amendments exhibited the highest growth rates of container stock and the greatest herbaceous species richness and cover. However, tilling without the other soil treatments reduced herbaceous cover and seedling recruitment (natural and sown). In tilled plots, gypsum treatments and humus treatments often had neutral or detrimental effects individually, but their combination greatly increased the success of direct seeding, growth of container stock, and herbaceous cover and richness. Finally, fencing increased volunteer tree recruitment tenfold compared to outside the plots. The data yielded by this study will be used to plan and implement larger restoration projects in area campgrounds.